

# PATENT SPECIFICATION



Application Date: July 21, 1926. No. 18,246 / 26.

263,053

Complete Accepted: Dec. 23, 1926.

## COMPLETE SPECIFICATION.

### Improvements in and relating to Gas Compressors.

I, STEFFA IMHOFF-PAPÁČKOVÁ, of 18, Schillerstrasse, Bale, Switzerland, of Swiss nationality, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The object of the present invention is a high speed valveless balanced piston compressor, in which each of two oppositely moving pistons is provided with two conducting channels relatively displaced both circumferentially and axially, the outlets of which at the piston circumference are axially at a distance equal to the piston stroke and of which one communicates with the cylinder space over the piston and the other with the cylinder space under the piston, the whole arrangement being such that in the outer dead point position, the one piston channel permits the compressed gas in the outer cylinder space to flow out through appropriate corresponding ports, and in the inner dead point position the other piston channel permits the compressed gas in the inner cylinder space to flow out through appropriate cylinder ports.

The accompanying drawings illustrate by way of example one embodiment of the invention.

Figure 1 is a longitudinal section in the outer dead point position of the pistons.

Figure 2 is a longitudinal section taken at right angles to Figure 1.

Figure 3 is a longitudinal section in the inner dead point position of the pistons.

Figure 4 is a longitudinal section taken at right angles to Figure 3.

Figures 5 and 6 are cross sections taken on the lines V—V and VI—VI of Figure 1 respectively.

The oppositely moving pistons 15 are [Price 1/-]

reciprocated in co-axial cylinders 1, 2, by the action of a crank shaft 20. The cylinder jacket 3 is divided into a suction chamber 4 and a pressure chamber 5 by two diametrically opposite partitions 6, 7. Each piston has two conducting channels 28, 29, relatively displaced circumferentially and axially, their outlets being displaced axially on the piston circumference by a distance equal to the piston stroke and of which one 28 communicates with the cylinder space 27 over the piston and the other 29 with cylinder space 26 under the piston. Further, each piston is provided with inlet ports 16 and 17, at a distance apart equal to the stroke. In the cylinder wall conducting ports 12 are provided on opposite sides of the partitions 6, 7.

Assuming that the pistons 15 are at the inner dead point (Figures 3 and 4) and that the compressor is in use for compressing air, when the crank shaft 20 is rotated, for which purpose a motor is assumed coupled to it, the pistons 15 will move towards the outer dead points and a reduction of pressure is produced in the space 26, while a rise in pressure takes place in the spaces 27. Shortly before the outer dead point is reached owing to the reduced pressure, a fresh charge flows into the space 26 out of the suction space 4 through the cylinder ports 12 and pistons ports 17 (Figures 1 and 2). At the same instant the air compressed in the spaces 27 passes through the conducting channels 28 in each piston, through the piston ports 18 and the cylinder ports 13 into the pressure space 5 and from thence to the place of use.

The pistons 15 now commence to return towards the inner dead point; a reduction of pressure then takes place in the cylinder spaces 27, while the

fresh charge enclosed in the space 26 is compressed. Shortly before the inner dead point is reached, owing to the reduction of pressure, fresh air flows from the jacket space 4 through the ports 12, 16 into the spaces 27, while at the same instant the compressed charge in the space 26 passes to the jacket space 5 through the piston channel 29, the ports 19 and 23, and from thence to the place of use.

With this motion of the pistons there is practically complete balancing of the masses.

The above described compressor has no valves. It ensures the highest output with the smallest size.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

A high speed valveless balanced piston compressor, in which each of two oppositely moving pistons is provided

with two conducting channels relatively displaced both circumferentially and axially, the outlets of which at the piston circumference are axially at a distance equal to the piston stroke, and of which one communicates with cylinder space over the piston and the other with the cylinder space under the piston, the whole arrangement being such that in the outer dead point position the one piston channel permits the compressed gas in the outer cylinder space to flow out through corresponding cylinder ports, and in the inner dead point position the other piston channel permits the compressed air in the inner cylinder space to flow out through corresponding cylinder ports.

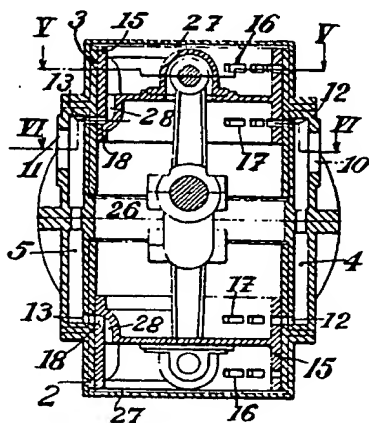
Dated this 21st day of July, 1926.

SEFTON-JONES, O'DELL &  
STEPHENS,

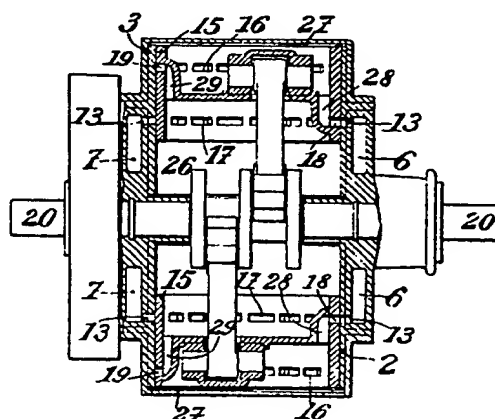
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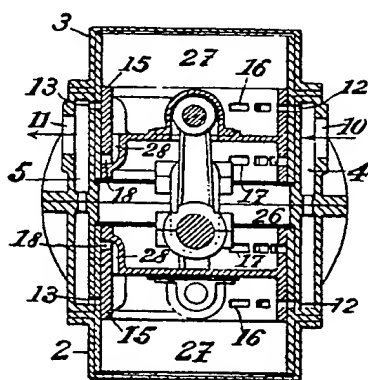
*Fig. 1.*



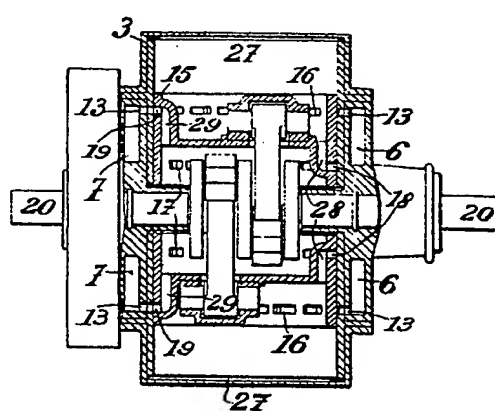
*Fig. 2.*



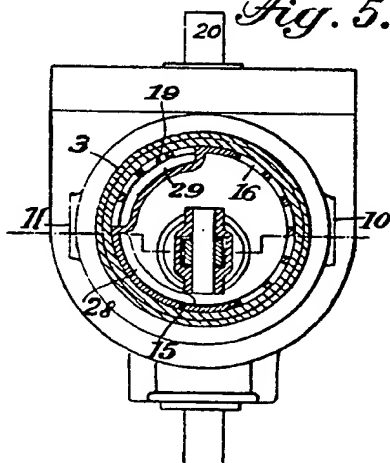
*Fig. 3.*



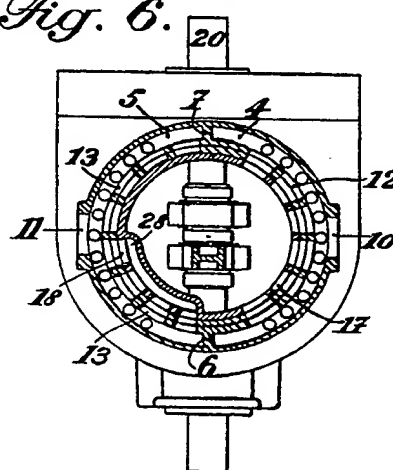
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*



*[This Drawing is a reproduction of the Original on a reduced scale.]*

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